

REMARKS

Summary of the Office Action

Claims 1 and 15 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,773,796 to Singer et al. ("Singer").

Claims 1 and 2 are rejected under 35 U.S.C. § 102(a) as being anticipated by U.S. Patent No. 6,580,895 to Hirst et al. ("Hirst").

Claims 2 and 16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Singer in view of Hirst.

The drawings are objected to.

Summary of the Response to the Office Action

Applicants have amended claims 1 and 15.

Applicants have added new claims 29-39.

Claims 1-39 are pending, of which claims 3-14 and 17-28 are withdrawn from consideration.

Applicants submit herewith a Submission of Replacement Sheets of Drawings.

All Claims Define Allowable Subject Matter

Claims 1 and 15 are rejected under 35 U.S.C. § 102(b) as being anticipated by Singer. Applicants respectfully traverse the rejection under 35 U.S.C. § 102(b). Applicants have amended claims 1 and 15 to correct idiomatic errors arising from the English language

translation of the claims. However, the amendments do not narrow the scope of the claims in any manner.

Claim 1 recites a thermal processing roller, including a heat transfer medium flowing path and a sealed chamber. The heat transfer medium flowing path heats a member abutting against a surface of the roller by a heat transfer fluid flowing through the heat transfer medium flowing path. The sealed chamber extends in a longitudinal direction of the roller within a thick portion of the roller. A heat transfer medium having a vapor phase and a liquid phase is sealed in the sealed chamber.

Claim 15 recites a thermal processing roller, including a heat transfer medium flowing path and a plurality of sealed chambers. The heat transfer medium flowing path heats a member abutting against a surface of the roller by a heat transfer fluid flowing through the heat transfer medium flowing path. Each of the sealed chambers extend in a longitudinal direction of the roller within a thick portion of the roller. A heat transfer medium having a vapor phase and a liquid phase is sealed in each sealed chamber.

Thus, for example, in the case of heating a resin film 13, when the heat transfer fluid passes through the heat transfer medium flowing tube 24, as shown in Fig. 3A, the heat transfer medium 25 within the sealed chamber 23 is heated and evaporated and the heat of the gas thus evaporated is applied to the resin film 13 through the roll shell 21 to thereby heat it. The gas from which the heat is absorbed is liquefied and heated again by the heat transfer fluid and so evaporated. Then, the heat of the gas thus evaporated is applied to the resin film 13 through the roll shell 21, thereby to again heat it. Such an operation is repeatedly performed. At the time of heating the resin film 13, the heat of the gas thus evaporated moves to the lower-temperature

side against which the member to be processed 13 abuts. Thus, even if there arises a temperature difference between the temperature at the inflow side of the heat transfer fluid and the temperature at the outflow side of the heat transfer fluid, the resin film 13 can be uniformly heated in the longitudinal direction along the axis core of the roller. Support for these features is provided at, for example, page 16, ll. 7-25, and illustrated in Figs. 1, 2, 3a and 3b of Applicants' specification.

Applicants submit that Singer fails to teach Applicants' inventions recited in claims 1 and 15 for at least two reasons. First, the Office Action relies on elongated heat pipe 31 of Singer for a teaching of both a heat transfer medium flowing path and a sealed chamber, as recited in claims 1 and 15. (Stops 33 and vessel wall 32 form the elongated heat pipe 31 of Singer). Applicants submit that heat pipe 31 cannot be both a heat transfer medium flowing path and a sealed chamber. Second, the elongated heat pipe 31 cannot be a heat transfer medium flowing path having a heat transfer fluid flowing through the heat transfer medium flowing path because heat pipe 31 is a vacuum tight vessel that is evacuated. (See col. 4, ll. 22-23 of Singer). Accordingly, Applicants respectfully submit that Singer does not teach or suggest at least the features of a heat transfer medium flowing path having a heat transfer fluid flowing through the heat transfer medium flowing path, as recited in claims 1 and 15.

Moreover, it is submitted that Singer not only fails to teach or suggest a heat transfer medium flowing path having a heat transfer fluid flowing through the heat transfer medium flowing path, but Singer teaches away from a heat transfer medium flowing path having a heat transfer fluid flowing through the heat transfer medium flowing path. As described at col. 1, ll. 40-50, Singer describes conventional attempts to ensure even distribution of heat to a heating

roller, including the use of a closed-loop heat exchanger system wherein heated oil is pumped through tubes that are axially disposed through the length of the roller. Heat is transferred from the tubes to the outer surface of the roller via an internal path. Singer alleges that problems exist with these types of systems because oil can leak and thus contaminate the roller assembly and product passing over the roller. Singer also alleges that such systems have a low efficiency. To overcome these alleged problems with closed-loop heat exchanger type systems, Singer teaches using a heating element 41 in lieu of heated oil being pumped through axially disposed tubes. (See col. 3, ll. 43-47 and col. 6, ll. 17-24 of Singer). Accordingly, Applicants respectfully request that the rejection under 35 U.S.C. § 102(b), of claims 1 and 15, be withdrawn.

Claims 1 and 2 are rejected under 35 U.S.C. § 102(a) as being anticipated by Hirst. Applicants respectfully traverse the rejection under 35 U.S.C. § 102(a). Applicants submit that Hirst fails to teach Applicants' invention recited in claim 1 for at least two reasons. First, the Office Action relies on interior space 306 of Hirst for a teaching of both a heat transfer medium flowing path and a sealed chamber, as recited in claim 1. Applicants submit that interior space 306 cannot be both a heat transfer medium flowing path and a sealed chamber. Second, the interior space 306 cannot be a heat transfer medium flowing path having a heat transfer fluid flowing through the heat transfer medium flowing path because interior space 306 is evacuated such that interior space 306 is maintained in a vacuum. (See col. 7, ll. 6-8 of Hirst).

Accordingly, Applicants respectfully submit that Hirst does not teach or suggest at least the features of a heat transfer medium flowing path having a heat transfer fluid flowing through the heat transfer medium flowing path, as recited in claim 1. Claim 2 depends from claim 1 and recites the same combination of allowable features recited in claim 1, as well as additional

features that define over the prior art. Accordingly, Applicants respectfully request that the rejection under 35 U.S.C. § 102(a), of claims 1 and 2, be withdrawn.

Claims 2 and 16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Singer in view of Hirst. Applicants respectfully traverse the rejection under 35 U.S.C. § 103(a). Claim 2 depends from claim 1 and claim 16 depends from claim 15. The dependent claims recite the same combination of allowable features recited in the respective independent claims, as well as additional features that define over the prior art. Applicants submit that Hirst fails to overcome the above-described deficiencies of Singer. Accordingly, Applicants respectfully request that the rejection under 35 U.S.C. § 103(a), of claims 2 and 16, be withdrawn.

The drawings are objected to. Applicants submit herewith a Submission of Replacement Sheets of Drawings. Figures 12 and 13 have been amended to include the legend "Related Art." Withdrawal of the objection to the drawings is requested.

Applicants have added new claims 29-39. Support for new claims 29-39 is provided at, for example, page 15, ll. 10-11 and 21, page 16, ll. 7-25, and Figs. 1, 2, 3a and 3b of Applicants' specification. Examination of new claims 29-39 is requested.

CONCLUSION

In view of the foregoing, Applicants respectfully request reconsideration and the timely allowance of the pending claims. Should the Examiner feel that there are any issues outstanding after consideration of this response, the Examiner is invited to contact Applicants' undersigned representative to expedite prosecution.

If there are any other fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-0310. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,

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